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CLINICAL PREPARATORY SIMULATION PROJECT FOR THE UNIVERSITY OF
SOUTHERN MISSISSIPPI DOCTOR OF NURSING PRACTICE NURSE
ANESTHESIA PROGRAM

by

Chigozie Ndugba

A Doctoral Project
Submitted to the Graduate School,
the College of Nursing and Health Professions
and the School of Leadership and Advanced Nursing Practice
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Nursing Practice

Approved by:

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ABSTRACT

The purpose of this DNP project was centered around teaching methodology and learning exhibited by an educational simulation. This approach supports the concept of replication, interaction, and pedagogy that enhance learning. In what is to follow, both the simulation objectives along with the rationales will be addressed. Then, the practical step-by-step simulation elements are explained. The educational and clinical evidence-based research is discussed further along, which gives insight necessary to foster learning and secure long-term retention.

The purpose of this DNP project was to improve health care by producing SRNAs with fundamental basics prior to entering the clinical setting to stimulate success in their future competence in the clinical environment. Incorporating an interactive simulation will help students gain not only confidence in the clinical areas but also be better prepared to develop critical thinking skills independently.

The simulation, as well as the evidence-based research, that was provided, were then scored by a panel of curriculum nurse anesthetist experts for exactness and level of quality. The panel also then reviewed the simulation for the effectiveness to which it could be utilized in the future via a survey. Their feedback, detailed simulation assessments, along with any other constructive criticism that supports the objectives of this simulation that were presented. Additionally, the results from this DNP project suggested that an interactive clinical preparatory simulation was an effective mechanism to increase clinical performance.

ACKNOWLEDGMENTS

The completion of this DNP project could not have been possible without the participation and assistance of so many people whose names may not all be detailed. Their contributions are sincerely appreciated and gratefully acknowledged. However, I would like to express my deep appreciation and indebtedness particularly to Dr. Nina McLain, Ph.D., CRNA; Dr. Michong Rayborn, DNP, CRNA; and Dr. Lachel Story, Ph.D., RN for their endless support, guidance, and understanding spirits throughout this process in vital roles as my committee chair and committee members.

DEDICATION

To God be all the glory! I would like to dedicate the completion of my DNP project to God. He has been by my side from the beginning and has guided me through every step towards becoming a nurse anesthetist. I am eternally grateful to Him. I also humbly dedicate this DNP project to my parents for their support in innumerable ways from the application process to daily prayers and devotionals that gave me the strength I needed in difficult times to press forward. Lastly, I thank my siblings, my closest friends and others who in one way or another shared their support, either morally, financially or physically, thank you.

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LIST OF ABBREVIATIONS

<i>AACN</i>	American Association of Nurse Anesthetists
<i>AANA</i>	American Association of Nurse Anesthetists
<i>BP</i>	Blood Pressure
<i>CRNA</i>	Certified Nurse Anesthetists
<i>CXR</i>	Chest radiograph
<i>DNP</i>	Doctor of Nursing Practice
<i>FiO₂</i>	Fraction of Inspired Oxygen
<i>IRB</i>	Institutional Review Board
<i>NAP</i>	Nurse Anesthesia Program
<i>NPO</i>	Nil Per Os
<i>OR</i>	Operating Room
<i>PONV</i>	Postoperative nausea and vomiting
<i>RSI</i>	Rapid Sequence Induction
<i>SpO₂</i>	Peripheral Capillary Oxygen Saturation
<i>SRNA</i>	Student Registered Nurse Anesthetist
<i>USM</i>	The University of Southern Mississippi

CHAPTER I – INTRODUCTION

Problem Description

The Nurse Anesthesia Program (NAP) at The University of Southern Mississippi was still early in its developmental stages and learning how to best shape its educational foundation. With that being said, both didactic and clinical feedback were desired to sustain continual improvements and progression for the future. One focus of the NAP that had been ongoing is clinical preparation. An area where there was room for improvement was foundational clinical preparation prior to student nurse anesthetists (SRNAs) starting their clinical rotations.

The purpose of this Doctor of Nursing Practice (DNP) project was to utilize evidence-based best practice guidelines for problem resolution. By incorporating best practice guidelines, this DNP project prepared nurse anesthesia students for the clinical environment through an interactive simulation. Clinical experience begins at a time of increased stress in nurse anesthesia school which can affect a student's confidence, critical thinking ability, and psychomotor proficiency (Elisha & Rutledge, 2011, p. S35). Evidence from a 2008 research study reinforces the correlation between nursing student's anxiety and clinical performance, stating that simulation decreases anxiety of nursing students and effectively prepares them to enter the clinical environment (Bremner, Aduddell, & Amason, 2008).

Transitioning from didactic learning into clinical and practical learning can be difficult for SRNAs. As an SRNA, clinical skills are essential to evolving as a safe and proficient anesthesia provider. SRNAs are obligated to translate their didactic learning into practice, keeping patient safety as a primary consideration.

In the clinical setting, SRNAs are under the supervision of health care educators, who also share moral obligations to ensure patient safety. These health care educators also utilize available instructional methods, such as simulation. Simulation can help to reduce clinical problems arising from the weight of stress and lack of confidence of students who are still improving their skills (Curiel, 2015).

Stress in nurse anesthesia school arises from immersion into new environments, information overload, adaptation to instructor teaching styles, exams, unemployment, role ambiguity, and firsts (e.g., first test, first clinical case, first induction, or intubation). With these many origins of increased stress for SRNAs, academic, clinical and external stressors are at the top of the list (Chipas, Cordrey, Floyd, Miller, & Tyre, 2012). According to Chipas et al. (2012), anesthesia is learned and practiced in a stressful environment. Financial and family stressors are still present and add to the persistent anxiety of anesthesia school.

In the classroom, students are bombarded with lectures, skill challenges, and are no longer experts as they once were in their nursing units. One important factor of various simulations to decrease the stress level of SRNAs. Incorporating simulations will help to increase not only student confidence but also success in the clinical environment. Classic studies have suggested there are significant negative correlations between anxiety and academic performance and grades (Chipas et al., 2012).

To help facilitate a smoother successful transition from the classroom to clinical, educational simulations were created. An article states the following about simulation:

Simulation enhances higher-order skills such as application, analysis, synthesis, and evaluation. It facilitates experiential learning by allowing for concrete

experience, observation, and reflection, forming abstract concepts and testing in new situations. It is well suited for the assessment of student performance in a clinical setting. It may increase the rate of student learning by allowing students to gain experience prior to entering the operating room. Oral examination of students allows the students to demonstrate they know how to handle a given scenario. In contrast, using simulation allows for the student to show how to manage a situation. Factors in performance such as delay in checking for circulation and proper airway management techniques can be assessed using simulation. (Curiel, 2015, p. 1)

The purpose of this DNP project was to prepare SRNAs for the clinical environment by incorporating teaching methodology and learning through an educational simulation. This approach supports the concept of replication, interaction, and pedagogy that enhance learning.

Available Knowledge

USM NAP always considers innovative techniques to expand and cultivate the methods in which the knowledge presented and retained to produce competent and confident SRNAs into the medical field. Clinical preparation is one of the areas to improve upon that would yield a progressive impact on the NAP as a whole. This DNP project was created to reflect how best practice guidelines can work in the form of a simulation. Current knowledge supports simulation as an effective educational tool for nursing education (Kim, Park, & Shin, 2016). The purpose of this simulation was to further encourage the best transition from didactic success into clinical expertise. The objective of this DNP project was to improve health care by producing SRNAs with

fundamental basics prior to entering the clinical setting and stimulate their future success, competence, and confidence in the clinical environment.

Evidence-based best practice guideline were utilized when proposing this educational simulation. The best practice guidelines, per the Registered Nurses' Association of Ontario (Registered Nurses' Association of Ontario, 2012), involved the following interventions: (a) identify the problem, (b) adapt knowledge to local context, (c) assess facilitators and barriers to knowledge use, (d) select and tailor implementation interventions and strategies, (e) monitor knowledge use and evaluate outcomes, and (f) sustain knowledge use. Incorporating these guidelines within my DNP project helped facilitate a comprehensive and thorough method to present the DNP objectives and intentions clearly.

To further explain each step in establishing the evidence-based best practice guidelines, the objectives must be clearly stated. Guidelines included how the problem originated, current gaps in practice, and key knowledge about the problem. For this DNP project, preparing SRNAs for clinical rotations is the objective. Preparation creates a foundation to ensure patient safety and quality of care. Adapting knowledge to local context is so that the reader will understand how to use the research from best practices done currently can be incorporated into solving the problem at hand. Simulation is included as best practice for nursing education (Kim et al., 2016). Completion of the simulation is when the initial development of infrastructure can be done.

Stakeholders are essential to the execution of the project (Registered Nurses' Association of Ontario, 2012). Stakeholders are analyzed and selected for their assistance in the completion of this DNP project. Stakeholders are invested to lead the

implementation process. The stakeholders will review the DNP project draft, make recommendations, and give feedback to be included in the final version. The resources section provides the data that are continuously included in a DNP project for better direction and to aid in monitoring the best evidence for successful completion of the DNP project stages.

With every project, facilitators and barriers will exist. The intention of including foreseen and unforeseen barriers was to provide a 360-analysis to maximize and overcome potential or factual roadblocks (Registered Nurses' Association of Ontario, 2012). Barriers in this DNP project are lack of participation or facilitators, poor equipment, and knowledge base deficit leading to poor connect with simulation education. Facilitators were individuals given a scenario script with simulation descriptions and objectives. Facilitators were any willing individual, but preferably an anesthesia provider or student that has a point of reference for the objectives.

Tailored implementation strategies and evaluated outcomes were completed in the final stages. Ongoing quality improvements were included per the stakeholders and further data collected and reviewed (Registered Nurses' Association of Ontario, 2012). This section in my DNP project also included a revision of appendixes relevant to the initial problem, simulation instructor guides, and simulation details. The last section of evidence-based best practice guidelines suggests an action plan template. This template states the mission of the DNP project, along with the vision, values, and performance appraisals (Registered Nurses' Association of Ontario, 2012). All feedback provided insight to better tackle the problem which ultimately aids in resolving it.

Additionally, this DNP project objective was to prepare SRNAs for their clinical rotations to ensure patient safety and quality of care. The ability of SRNAs to provide quality and safe care was of the utmost importance. CRNAs are educated to perform all the tasks that an anesthesiologist can perform. Nurse anesthetists have dominated the specialty of anesthesia for approximately 150 years in the United States before the influx of physicians in the specialty during the mid-1980s (Dulisse & Cromwell, 2010). According to research, the profession of nurse anesthesia provides the same level of safety and quality of care as an anesthesiologist (Dulisse & Cromwell, 2010). Annually, CRNAs provided 30 million surgical anesthetics in the United States and comprised two-thirds of rural anesthesia providers (Dulisse & Cromwell, 2010).

Learning the art of anesthesia is not easy. The majority of nurse anesthesia educational processes take place in the clinical setting. SRNAs are expected to develop trusting relationships with clinical preceptors, observe cases, and participate in real cases, which allows them to grow into the role of a nurse anesthetist (Smith, Swain, & Penprase, 2011). According to Grost and Brooks (2013), a trend in many NAPs today is focused on implementing organized activities to enable successful transition with stronger and more competent graduates in the workforce (Grost & Brooks, 2013).

Currently, learning has been accomplished through both simulation and lecture-guided classrooms among nurses. Research suggested that when comparing no simulation versus simulation-education interventions, technology-enhanced simulation training in health professions education is consistently associated with large effects for outcomes of knowledge, skills, and behaviors (Cook et al., 2011). Simulation-based education

incorporates instructional design, curriculum-focused objectives, mastery learning, repetitive practice, and provision of feedback and debriefing (Cook et al., 2011).

The American Association Nurse Anesthetists (AANA) Standards for Nurse Anesthesia Practice created standards for CRNAs to follow to ensure guidance in practice (American Association of Nurse Anesthetists [AANA], 2013). These standards help to evaluate the quality of care, create a consensus for CRNAs to abide by, preserve and support the rights of patients while sharing the expectations of CRNAs with colleagues and the general public (AANA, 2013). Ultimately, CRNAs are responsible for the quality of services they render.

This DNP project was targeted to create an interactive simulation. This simulation not only prepared students for their clinical experiences but also taught the important basic elements regarding the administration of anesthesia. The evidence-based research that supports this project request were standards III, IV, V, and VIII of the AANA for Nurse Anesthesia Practice guidelines (AANA, 2013).

Standard III of the AANA Standards for Nurse Anesthesia Practice requires anesthesia providers to formulate a patient-specific plan for anesthesia care (AANA, 2013). Although the patient technically makes the ultimate decision, the anesthesiologist is bound to provide treatment that is considered “standard of care,” and realistically determines the type of anesthesia a patient will get for their operation. Examples of different kinds of anesthesia include general anesthesia, regional anesthesia, combined general and epidural anesthesia, and monitored anesthesia care with conscious sedation (MAC, 2018).

Standard V of the AANA Standards for Nurse Anesthesia Practice guidelines states to monitor, evaluate, and document the patient's physiologic condition as appropriate for the type of anesthesia and specific patient needs (AANA, 2013). When any physiological monitoring device is used, variable pitch and threshold alarms shall be turned on and audible. The CRNA should attend to the patient continuously until the responsibility of care has been accepted by another anesthesia professional.

Vital signs (i.e., measurements of blood pressure (BP), heart rate, oxygen saturation, temperature, and respiratory rate) are collected before induction. Measuring vital signs prior to induction will give the anesthesia provider a baseline of the patient's hemodynamic status. Vital signs are an important component of patient care (Flores, 2015). They determine which treatment interventions to take, provide critical information needed to make life-saving decisions, and confirm feedback on treatments performed (Sears, 2007). Accurate, documented vital signs are an important part of anesthesia care.

Intubation can potentially become a lengthy procedure, the risk of arterial oxygen desaturation during intubation must be considered. Preoxygenation should be routine, as oxygen reserves are not always sufficient to cover the duration of intubation. Three minutes of spontaneous breathing at a fraction of inspired oxygen (FiO_2) equals 1 will allow denitrogenation with arterial oxygen saturation close to 95% in patients with normal lung function (Bouroche & Bourgain, 2015). Tolerable apnea time, defined as the delay until the peripheral capillary oxygen saturation (SpO_2) reaches 90%, can be extended up to almost 10 minutes after 3 minutes of classic preoxygenation. Eight deep breaths within 60 seconds allow a comparable increase in oxygen reserves. For effectiveness, the equipment must be adapted and tightly fitted.

Standard IV of the AANA Standards for Nurse Anesthesia Practice guidelines state to implement and adjust the anesthesia care plan based on the patient's physiologic status (AANA, 2013). Standard IV also includes to continuously assess the patient's response to the anesthetics, surgical intervention, or procedure. Medications are given based on the milligram per kilogram safety therapeutic index. Each anesthesia provider takes the patient's medical history, surgical history, comorbidities, and emergency drugs into account when deciding on medication dosages to administer.

Standard VIII of the AANA Standards for Nurse Anesthesia Practice guidelines states to adhere to appropriate safety precautions as established within the practice setting to minimize the risks of fire, explosion, electrical shock, and equipment malfunction (AANA, 2013). Ensure that the equipment reasonably expected to be necessary for the administration of anesthesia has been checked for proper functionality and document compliance based on the patient, surgical intervention, or procedure. Patient vital signs monitoring are vital for surgery along with a proper machine check. Ensuring that all proper equipment is properly working and available measure essential for a successful procedure.

Further considerations for room set up included specifics for the patient, type of anesthesia, pharmacology, positioning, and surgery type. Each student must also be able to formulate an entire room set up with the given information about the patient with regard to his/her weight, medications, allergies, and comorbidities. This room set up also includes completing a machine check when during a room set up.

Rationale

A major concept that was utilized in this DNP project was simulation module design and development. “An instructional simulation, also called an educational simulation, is a simulation of some type of reality (system or environment) but which also includes instructional elements that help a learner explore, navigate or obtain more information about that system or environment that cannot generally be acquired from mere experimentation. Instructional simulations are typically goal-oriented and focus learners on specific facts, concepts, or applications of the system or environment.” (Bremner et al., 2008, p. 31). A simulation would better assist SRNAs to learn and grow their technical skills before going into the hospital setting.

Literature supports the idea that simulation-based education with deliberative practice can achieve specific clinical goals relating to patient safety. Meanwhile, the National League of Nursing has endorsed study findings that conclude that simulation can be substituted for up to 50% of traditional clinical experiences (Lippincott Nursing Education, 2018). Because of the dynamic nature of simulation-based training, a number of other valuable learning points will emerge during the scenarios. These learning point may arise from the participants’ mistakes or resourceful actions or interactions with their coworkers, the patient, their relatives, or the equipment and should also be discussed during the debriefing, as they contribute greatly to the overall learning experience (Ziv, Ziv, & Ben-David, 2005). The rationale for simulations are to facilitate a learning environment that includes formal and informal frameworks, models, concepts, and theories used to explain the problem or assumption used to develop the intervention.

Specific Aims

The purpose of this simulation was to further encourage the best transition from didactic success into clinical expertise. This DNP project was created to prepare SRNAs for clinical rotations with best practice guidelines. With the incorporation of best practice guidelines, a simulation was created to evaluate the progression of students and improve in the areas that need the most assistance. Strengthening the clinical skill set of SRNAs, so too will the care rendered to patients.

Ultimately, health care will benefit from improved education and guidance prior to the start of clinical rotations with simulations. With simulation, patient care would also improve. By producing SRNAs with fundamental basics prior to entering the clinical setting and stimulate their future success, competence and confidence in the clinical environment will improve.

Summary

The American Association of Nurse Anesthetists (AANA) created standards for CRNAs to follow to ensure guidance in practice (AANA, 2013). These standards help to evaluate the quality of care, create a consensus for CRNAs to abide by, and preserve and support the rights of patients while sharing the expectations of CRNAs with colleagues and the general public (AANA, 2013). Ultimately, CRNAs are responsible for the quality of services they render. The evidence-based research that supports this DNP project are standards 2, 3, 4, 6, 7 and 9 of the AANA Practice guidelines.

CHAPTER II – METHODS

Context

Currently, an issue with the USM Nurse Anesthesia Program (NAP) was that students can be better prepared when beginning clinical rotations. A community of USM CRNA faculty educator experts were included with this DNP project to better evaluate the project and to help construct a detailed solution for students. Steps to publish this policy project encompassed the following interventions: Institutional Review Board (IRB) approval (IRB number 19-58, see Appendix B), a panel of experts (two NAP faculty, one USM administrator, and one USM NAP student 2020), a policy draft including details of a simulation with its intended objectives, presentation of the policy draft to the panel of experts for policy revision, policy revision, simulation introduction to NAP 2020 cohort, post-introduction feedback from NAP faculty revisions, and finally publication of the new policy into the Nurse Anesthesia Curriculum Policy Handbook.

The objective of this DNP project was to propose a way to incorporate the best teaching practices to prepare clinically through an interactive simulation. This simulation included three areas considered to be critical as well as fundamental when entering the hospital as an SRNA. The three educational areas of this simulation included the following: a) specifics to the patient (e.g., weight, current medications, allergies, comorbidities, conditions, vital signs, electrocardiogram (EKG), chest radiograph (CXR), nil per os (NPO) status, airway assessment, postoperative nausea and vomiting (PONV), rapid sequence induction (RSI), b) specifics to the anesthesia (e.g., type of anesthesia, machine check, and pharmacology), and c) specifics to the surgery (e.g., short/long case, positioning, nerve stimulator).

A point system was formulated to meet the objectives of this simulation. The point system, which considers an 80% or above as a good and passing grade, is based on current guidelines of following: student creates an anesthesia management plan for the patient will receive 4 points and does a complete machine check would receive 10 points (see Appendix D). Included in the simulation package was an overview of the simulation, instructor guide, simulation outline, an anesthesia management plan scenario, a debriefing document, and an evaluation form. The instructor guide (see Appendix E) explains the purpose of the simulation along with the other attached documents.

The student was given the same sheet but without a scoring section. The student was given 30 minutes to complete this simulation by addressing each section with the mannequin in the simulation laboratory receiving points along the way. The student was allowed to start clinical when they received an 80% or better. The first section is 40 points, the second section is 40 points and the last section is worth 20 points, totaling up to 100%. This point system, which considers 80% or above as a good and passing grade, is based on the current Guidelines of USM NAP grading scale.

The anesthesia management plan scenario (see Appendix G) was explained to the SRNA for how to properly set up the operating room (OR) (Stanford, 2018). Once the SRNA set up the OR, the CRNA faculty used the scoring sheet (see Appendix F) to obtain a grade. The Instructor guide (see Appendix E) was a guide for the facilitator with overviews to better run a smooth simulation. The debriefing document (see Appendix H) was to document areas discussed with the student of errors made and constructive feedback. The evaluation form (see Appendix I) was for the DNP project stakeholders for feedback about the simulation for areas of improvement.

Measures

Outcome measures were indicated by scores obtained from simulation return demonstrations. These scores indicate a positive or negative outcome. The total possible points for the simulation total 100 points. Greater than 80 points indicated a positive outcome and scores less than 80 points indicate a negative outcome.

Ethical Considerations

Although this DNP project does not include actual patients, two ethical considerations were taken into account. USM and the NAP class of 2018 and class of 2019 did not have the opportunity to participate in this simulation. These two levels of education were included as ethical considerations because they were not able to benefit from an educational simulation which would have helped to prepare them for their clinical experience. After the initial simulation is presented to the class of 2020, modifications can be made to improve the simulation for future SRNAs.

Summary

As far as the methodology goes, a simulation was created that focused on three critical sections (specifics to the type of anesthesia, specifics to the patient, and specifics to the surgery). All the areas included are important, not only to know before starting clinical rotations, but they also aligned with the AANA standards of care to ensure patient safety. The instructor is given an instructor's sheet with a patient who is scheduled for surgery that states the patients' age, comorbidities, pertinent history, and the surgical procedure scheduled.

CHAPTER III - RESULTS

The process for data collection included a survey that was given to all nurse anesthesia faculty at USM to gather data to determine whether or not the simulation would be beneficial for its intended objective. Five questions that were asked are the following: (1) about if the simulation information was evidence-based, (2) relevant to the nurse anesthesia practice, (3) whether or not the education level of activity presented was appropriate for the cohort participating, (4) if the simulation addresses proficiencies necessary for clinical preparation, and (5) if the policy directions are clearly and easily stated.

The survey was distributed to nurse anesthesia faculty via email and collected 1-2 weeks post-administration. The results were collectively equal among all the faculty, stating that the simulation was evidence-based, relevant to nurse anesthesia practice, was at the appropriate educational level of the cohort participating in the simulation, addressed proficiencies necessary for clinical preparatory and that the policy is clearly and easily read. Results concluded that this simulation would be incorporated into the preclinical week.

Summary

The purpose of this simulation is to further encourage the best transition from didactic success into clinical expertise. The objective of this DNP project is to improve health care. One way to improve health care was to produce SRNAs with the fundamental basics prior to entering the clinical setting to stimulate success in their future competence in the clinical environment and, ultimately, improve the quality of patient care and patient outcomes.

CHAPTER IV – CONCLUSION

In conclusion, all four of the nurse anesthesia faculty reported that the simulation was evidence-based and would be beneficial to incorporate into the preclinical simulation week. This simulation would be incorporated into the 2020 cohort prior to them entering the hospital setting. No additional comments were given with results of the surveys.

The purpose of this DNP project was to equip SRNAs for their clinical training before they enter the hospital. An educational simulation was created to aid SRNAs by decreasing the stress of CRNA school and ultimately not only increasing a student's confidence but also improving their critical thinking ability and psychomotor proficiency. This project was targeted to also teach important basic elements regarding the administration of anesthesia. The evidence-based research that supports this project are standards III, IX, and VI of the AANA for Nurse Anesthesia Practice guidelines.

As stated previously, the rationale for an interactive simulation was to facilitate a learning environment that includes formal and informal frameworks, models, concepts, and theories used to explain the problem or assumption used to develop the intervention. With the various and dynamic nature of simulation-based training, a number of other valuable learning points emerged during the scenarios. These learning points may arise from the participants' mistakes or resourceful actions or interactions with their coworkers, the patient, their relatives, or the equipment and should also be discussed during the debriefing, as they contribute greatly to the overall learning experience (Ziv et al., 2005).

Limitations in this DNP project included a limited number of participants. Since this simulation was a pioneer interactive educational simulation, the simulation would be

presented to the next cohort going into the clinical environment. The advantages and disadvantages would not be accurately assessed or modified for improvement until SRNAs partake in the simulation. If the simulation is only given to a new cohort that has not yet entered the hospital, a gap in information exists that could otherwise improve the basis for which the simulation was created.

A few suggestions for future study include administering a poll to first-year SRNAs who have completed the simulation before clinical and get their feedback on whether or not it actually was helpful, what to include that may have been overlooked, and what to remove. Another suggestion is to include first, second and third-year SRNAs to survey whether the simulation is truly beginner-friendly. Including second and third-year SRNAs would help to better evaluate the simulation as a whole for future students to revise for the advancement of SRNAs to follow.

APPENDIX A – Questionnaire

Questionnaire

Name(s) of USM faculty:

Date: __ / __ / __

	<u>Strongly Disagree</u>				<u>Strongly Agree</u>	
1. The policy is evidenced based.	N/A	1	2	3	4	5
2. The policy is relevant to nurse anesthesia practice.	N/A	1	2	3	4	5
3. The policy's educational level of the activity presented is appropriate for the USM cohort being addressed.	N/A	1	2	3	4	5
4. The policy is current and addresses the proficiencies necessary for clinical preparation.	N/A	1	2	3	4	5
5. The policy directions are stated clearly and easily understood.	N/A	1	2	3	4	5

Please provide any comments, changes, or additional information you want to include in this policy below.

APPENDIX B –IRB Approval Letter

Date: 8-25-2019

IRB #: IRB-19-58

Title: BEST PRACTICE GUIDELINES FOR CLINICAL PREPARATORY SIMULATION PROJECT FOR UNIVERSITY OF SOUTHERN MISSISSIPPI DOCTOR OF NURSING PRACTICE-NURSE ANESTHESIA PROGRAM

Creation Date: 1-25-2019

End Date:

Status: Approved

Principal Investigator: Chigozie Ndugba

Review Board: Sacco (Exempt/Expedited Board)

Sponsor:

Study History

Submission Type	Initial	Review Type	Exempt	Decision	Exempt
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Key Study Contacts

Member	Chigozie Ndugba	Role	Primary Contact	Contact	chigozie.ndugba@usm.edu
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APPENDIX C –DNP Essentials

Which AANA Standards for Nurse Anesthesia Practice were included in this simulation?	What is the description of this standard?	How was it incorporated into the preclinical simulation?
Standard III, IV, and VII	<p>Standard 3: Plan for Anesthesia Care After the patient has had the opportunity to consider anesthesia care options and address his or her concerns, formulate a patient-specific plan for anesthesia care. When indicated, the anesthesia care plan can be formulated with members of the health care team and the patient's legal representative (e.g., health care proxy, surrogate).</p> <p>Standard 4: Informed Consent for Anesthesia Care and Related Services Obtain and document or verify documentation that the patient or legal representative (e.g., health care proxy, surrogate) has given informed consent for planned anesthesia care or related services in accordance with the law, accreditation standards, and institutional policy.</p> <p>Standard 7: Anesthesia Plan Implementation and Management Implement and, if needed, modify the anesthesia plan of care by continuously assessing the patient's response to the anesthetic and surgical or procedural intervention. The CRNA provides</p>	specifics to the anesthesia (the type of anesthesia, consent, and pharmacology). What is your anesthesia plan?

	anesthesia care until the responsibility has been accepted by another anesthesia professional.	
Standard IX	Standard 2: Pre-anesthesia Patient Assessment and Evaluation Perform and document or verify documentation of a pre-anesthesia evaluation of the patient's general health, allergies, medication history, preexisting conditions, anesthesia history, and any relevant diagnostic tests. Perform and document or verify documentation of an anesthesia-focused physical assessment to form the anesthesia plan of care.	specifics to the patient (weight, current medications, allergies, comorbidities, conditions, vital signs, EKG, CXR, NPO status, airway assessment, PONV, RSI).
Standard VI	<p>Standard 6: Equipment Adhere to the manufacturer's operating instructions and other safety precautions to complete a daily anesthesia equipment check. Verify function of anesthesia equipment prior to each anesthetic. Operate equipment to minimize the risk of fire, explosion, electrical shock, and equipment malfunction.</p> <p>This practice guidelines states to adhere to appropriate safety precautions as established within the practice setting to minimize the risks of fire, explosion, electrical</p>	specifics to the surgery (considerations for short/long case, proper positioning, machine check)

	<p>shock, and equipment malfunction</p> <p>Standard 9: Monitoring, Alarms Monitor, evaluate, and document the patient's physiologic condition as appropriate for the procedure and anesthetic technique. When a physiological monitoring device is used, variable pitch and threshold alarms are turned on and audible. Document blood pressure, heart rate, and respiration at least every five minutes for all anesthetics.</p> <p>This practice guideline states to monitor, evaluate, and document the patient's physiologic condition as appropriate for the type of anesthesia and specific patient needs</p>	
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APPENDIX D – Overview of Simulation

Time Duration	
Setup	5 min
Orientation	5 min
Simulation	15 min
Debriefing	15 min
TOTAL	40 min

Anesthesia Room Setup Simulation
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College of Nursing – Nurse Anesthesia Program
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Resource File and Purpose:

- I. Instructor Guide
A general overview of the simulation for the instructor.
- II. Simulation Outline
A guide to the specifics of the simulation.
- III. Anesthesia Management Scenario
This simulation process correlates with the suggested format to set up a general OR room as outlined by Stanford Medicine Anesthesia Department (Stanford Medicine, 2018).
- IV. Debriefing Document
A debriefing phase is to discuss where errors were made, constructive feedback and overall reflective questioning about the simulation performance. This can be given to the learner upon completion of further study.
- V. Evaluation Form
Each student will complete an evaluation form at the end of the simulation to further enhance the quality and educational improvement of the simulation.

Conceptual Background: This simulation functions as a tool for training, evaluating, and reinforcing material learned in the classroom. Students with a range of diverse experiences can utilize this simulation module for further learning regarding the anesthesia room setup. This complementary simulation-based learning permits teaching that a) reduces patient risk by giving learners a chance to become aware of the condition before treating a real patient, b) is observable and repeatable, c) allows for the freedom to make mistakes and reflect upon different actions in the future. Therein the scenario is used for practice, evaluation, and self-identification of weaknesses in the learner's knowledge base in regard to perioperative management of a patient.

Objective: The purpose of this simulation is to prepare nurse anesthesia students for the clinical environment through an interactive simulation. “Clinical experiences are one of the major stressors in nurse anesthesia education and have a direct impact on student development in areas such as self-awareness, critical thinking, psychomotor proficiency, and professionalism. (Elisha & Rutledge, 2011).”

Authors and their Affiliations: Chigozie Ndugba (Nurse Anesthesia Student), University of Mississippi, Hattiesburg, MS.

Revisions: This is the first anesthesia simulation to be incorporated into the USM preclinical week for the NAP. There are not any revisions suggested at this time. This simulation is intended to launch the fall of 2018. This simulation is expected to be held for every class prior to starting clinical rotations.

Performance Expectations and Anticipated Management Mistakes: With initiation of this simulation, it is expected that students make mistakes. Early detection and anticipating needs for different types of surgeries may be overlooked. Although students have didactic education about surgeries, the anxiety and pressure to perform instinctively will come with time. It is up to the instructor to incorporate verbal debriefing to help reinforce desired behaviors, investigate the learner’s thinking that led to such behaviors and ask oral board style questions to expand the depth of knowledge. Despite the appropriate and comprehensive diagnosis, induction, and management, we have (at times) forced the patient into otherwise unlikely states to continue with the simulation. We do this to remind our learners that appropriate management can still fail, and to allow them a chance to consider how they handle crisis situations.

APPENDIX E – Instructor Guide

- A. Case Title: Anesthesia Simulation – Scenario Introduction
- B. Target Audience: University of Southern Mississippi Nurse Anesthesia Program second-year cohort
- C. Learning Objectives: At the conclusion of the simulation and debriefing session, the learner will have had the opportunity to demonstrate success in 3 specific areas pertaining to preoperative patient assessment, room set up, and surgery management as outlined by standards of the American Association of Nurse Anesthetists for Nurse Anesthesia Practice guidelines as they relate to each particular clinical scenario.
- D. Specifics to the Patient, Anesthesia, and Surgery:
 - 1. Preoperative Patient Evaluation, Assessment, and Preparation: Assesses patient weight, current medications, allergies, comorbidities/conditions, NPO status, airway assessment, PONV, RSI, etc.
 - 2. Anesthetic Plan and Conduct: Formulates and tailors an anesthetic plan that includes consideration of medical, anesthetic and surgical risk factors for drug interactions. The type of anesthesia, consent, and pharmacology are all discussed.
 - 3. Management of Perioperative Complications: Recites and manages population adequately and specifically to patient needs. considerations for short/long cases, proper positioning, machine check, etc.
 - Crisis Management: Manages clinical crises during simulation if any should arise.
 - Technical Skills: Airway Management: Demonstrates ability to manage the airway in a safe manner including bag-mask ventilation, oral/nasal airway placement and endotracheal intubation/LMA placement, endotracheal suctioning.

APPENDIX F – Simulation Outline

- Patient considerations (0-40 points)
 - Plan for anesthesia management (with regard to weight, current medications, allergies, comorbidities/conditions, NPO status, airway assessment, PONV, RSI) (4 points each = 40 points)
 - vital signs: pulse oximetry, blood pressure, EKG, and temperature (5 points each = 20 points)
- Anesthesia considerations (0-40 points)
 - Machine check
 - Proper equipment for the type of anesthesia including airway equipment
 - suction, oxygen, IV tubing and tape
 - Preoxygenate/ denitrogenate (10 points each = 40 points)
- Surgical considerations (0-20 points)
 - Positioning (specialized positioning will provide good access for the surgeon to the site and preventing injury)
 - Pharmacology (appropriate drug selection or patient including emergency drugs- mg/kg for safety therapeutic based on each patient weight and comorbidities.) (10 points each = 20 points)

Critical Actions Checklist:

- Patient Considerations (4 points each)
 - ☐ Confirms NPO status
 - ☐ Confirms allergies
 - ☐ Confirms medication list
 - ☐ Confirms history
 - ☐ Auscultates the heart
 - ☐ Auscultates the lungs
 - ☐ Weight
 - ☐ PONV history
 - ☐ RSI
 - ☐ 2 patient identifiers
- Anesthesia Considerations (10 points each)
 - ☐ Machine check completed
 - ☐ Proper equipment for the type of anesthesia including airway equipment
 - ☐ Suction, oxygen, IV tubing and tape
 - ☐ Preoxygenate/ denitrogenate
- Surgical Considerations (10 points each)
 - ☐ Positioning (Be sure to check all pressure points. Specialized positioning will provide good access for the surgeon to the site and preventing injury.)
 - ☐ Pharmacology (appropriate induction medications selection, including emergency drugs)

- Extra Credit Points

- ☐ Performs maneuvers for difficult bag-mask ventilation (repositions head, confirms mask seal, increases closing pressure of pop-off valve)
- ☐ Provides additional airway management if needed

- Props for additional points

- ☐ Performs maneuvers for difficult bag-mask ventilation (repositions head, confirms mask seal, increases closing pressure of pop-off valve)
- ☐ Provides additional airway management if needed

Monitors Required	Other Equipment Required
Non-invasive BP cuff	Anesthesia machine
Capnograph	Endotracheal tube
Temperature probe	Laryngeal mask airway
Nerve stimulator	Laryngoscope
Pulse oximeter	Stethoscope
3 lead (EKG) electrocardiogram	Defibrillator/crash cart
	Albuterol adapter for endotracheal tube

Scoring Sheet	Points Acquired
Patient considerations (0-40 points)	
Anesthesia considerations (0-40 points)	
Surgical considerations (0-20 points)	
Calculation of Total Points	

APPENDIX G – Anesthesia Management Plan Scenario

Name: Stephanie Perryon Age 52 Wt: 113Kg Ht: 5'2
Procedure: Laparoscopic Colectomy, possible open with common duct exploration
Diagnosis: Colon mass – nonmalignant, possible mass in small bowel near the common bile duct
Smoking Hx: 1 ppd x 10 yrs ETOH: Occasionally
Home life: Married with 4 kids Surgeon: Dr. Hammond

Medications:

HCTZ 12.5mg QD swelling
Prilosec qAM
Aleve i-ii per day prn pain
Pepcid 20mg qAM
Aldomet 1 qAM
metoprolol qAM

Allergies: none

Problem list: (in the problem list you will list all the patient tells you plus use the information you have in the record to complete the picture of the patient)

Oral History:

HTN x 1 year, gastric reflux, abdominal pain x 8 weeks,

Exercise tolerance: Fair

VS: 152/90, P-75 R-18 SaO2-98% (room air), Temp 98.7f

Family history of anesthesia complications or MH: Negative

Previous Surgery: Significant PONV after each surgery in PACU

Appendectomy, 1990 Breast Biopsy, 2012 Partial gastrectomy, 2010
EGDs last one 2015

LABS: H/H 14.0/38.7, WBC 7000, K+ 2.8, Na++ 140, Glucose 110

CXR: not done

EKG: none

Chart HX: Abdominal pain x 2 weeks, saw physician, abnormal CT showing a mass in the right colon, probably non-malignant. Difficulty eating and frequent bouts of nausea and abdominal cramping.

Otherwise a healthy person with fair activity level

APPENDIX H – Debriefing Document

- (1) Analysis of Practice to Identify Areas in Need of Improvement: Manages adverse events. Modifies personal practice to minimize the likelihood of recurrence of adverse events related to routine anesthesia care.
- (2) Self-Directed Learning: Reviews the literature and information relevant to the specific clinical scenario.
- (3) Receiving and Giving Feedback: Consistently seeks feedback, correlates it with self-reflection, and incorporates it into lifelong learning to enhance patient care.

APPENDIX I –Evaluation Form

Name(s) of faculty being evaluated:

Date: __/__/__

Scenario: Laparoscopic Colectomy

You (the learner/evaluator) are:

____ Anesthesia Faculty

____SRNA

____CRNA

<u>Instructor</u>	<u>Strongly Disagree</u>			<u>Strongly Agree</u>		
1. The simulation created an environment that was conducive to learning.	N/A	1	2	3	4	
2. The simulation helped me recognize and understand the importance of things I did well.	N/A	1	2	3	4	
3. The simulation helped me to learn from my actions something that I might do differently.	N/A	1	2	3	4	
4. The simulation presented pertinent content clearly & concisely.	N/A	1	2	3	4	
5. The simulation clearly demonstrated the required skills necessary to set up an OR room properly.	N/A	1	2	3	4	
6. After the simulation, I feel more confident in my ability to set up an OR room with proper equipment.	N/A	1	2	3	4	

<u>Content/Simulation</u>	<u>Strongly Disagree</u>			<u>Strongly Agree</u>		
1. The content was current & relevant to anesthesia.	N/A	1	2	3	4	
2. The educational level of this activity was appropriate.	N/A	1	2	3	4	
3. The course enhanced my understanding of how to handle critical situations and crisis management.	N/A	1	2	3	4	
4. The simulation experience provided a realistic model of working in a clinical setting.	N/A	1	2	3	4	
5. I understand that this is a confidential learning environment designed to challenge & improve my practice.	N/A	1	2	3	4	

Comments:

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